Changes in sentiment on Russia-Ukraine War

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Introduction

- The ongoing Russia-Ukraine war has been heavily discussed in social media.

- How do sentiment and discourse change as the war progresses?

- Client: a non-profit organization hoping to raise funds for Ukrainian refugees

Methodology

- Data

    - Kaggle dataset: ~26 million tweets (at time of analysis)

    - Subsample of 100k tweets from select days
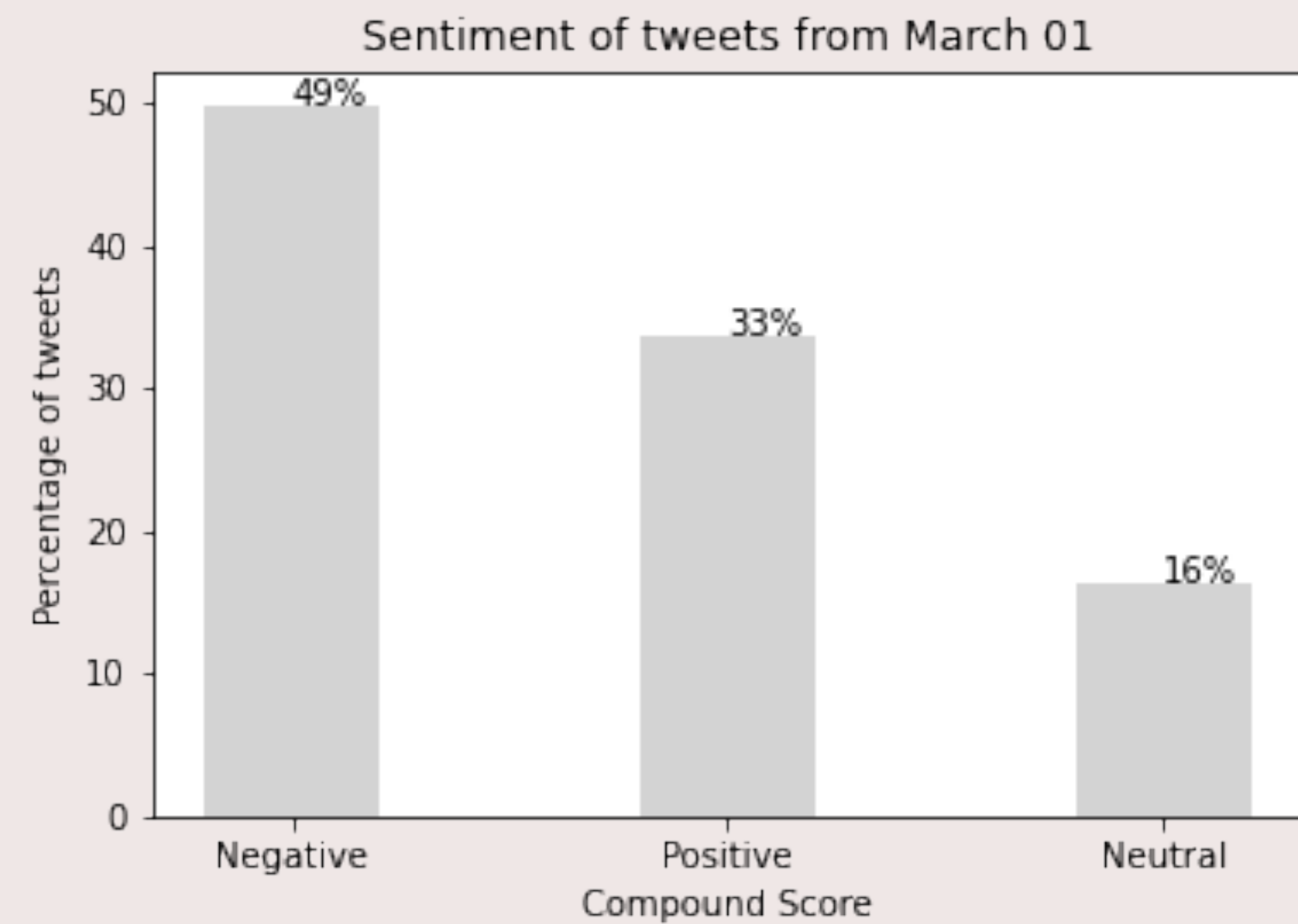
Methodology

- Data

  - March 01, 2022   Russia completely surrounds Mariupol

  - March 13, 2022   Russia attacks military base; 35 people killed, 130 hospitalized

  - March 15, 2022   Russia besieges Mariupol hospital; hundreds held hostage

  - March 16, 2022   Russia bombs Mariupol Theater being used as shelter; hundreds killed

  - April 03, 2022   Russia withdraws from Bucha, leaving evidence of atrocities

  - April 08, 2022   Russia strikes Kramatorsk railway station

Methodology

- Tools

  - Pandas and NLTK - cleaning and processing

  - VADER - sentiment analysis

  - CountVectorizer

  - Matplotlib and ScatterText - visualization

Methodology

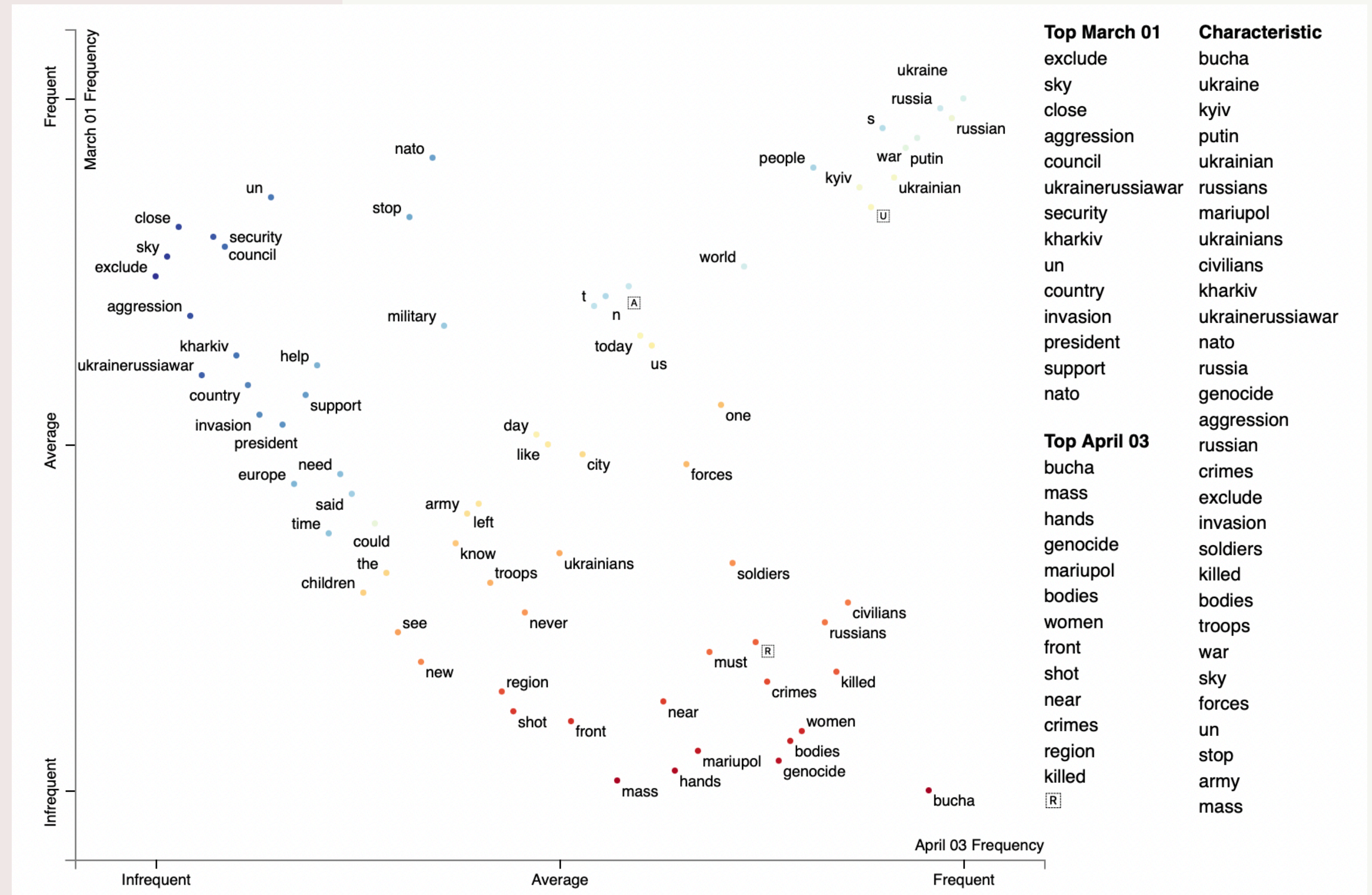- Sentiment Analysis with VADER:

  - Compound Score

Sentiment of tweets from March 01 — Negative 49%, Positive 33%, Neutral 16%

Sentiment of tweets from March 13 — Negative 51%, Positive 32%, Neutral 15%

Sentiment of tweets from March 15 — Negative 44%, Positive 40%, Neutral 15%

Sentiment of tweets from March 16 — Negative 45%, Positive 39%, Neutral 15%

Sentiment of tweets from April 03 — Negative 59%, Positive 24%, Neutral 15%

Sentiment of tweets from April 08 — Negative 52%, Positive 31%, Neutral 15%

Results

- During March, sentiment remained relatively stable

- Sharp increase in negative sentiment on April 3

- Russian withdrawal from Bucha

Russia-Ukraine war sentiment
sub-sample of 100K tweets

Legend: Negative, Positive, Neutral
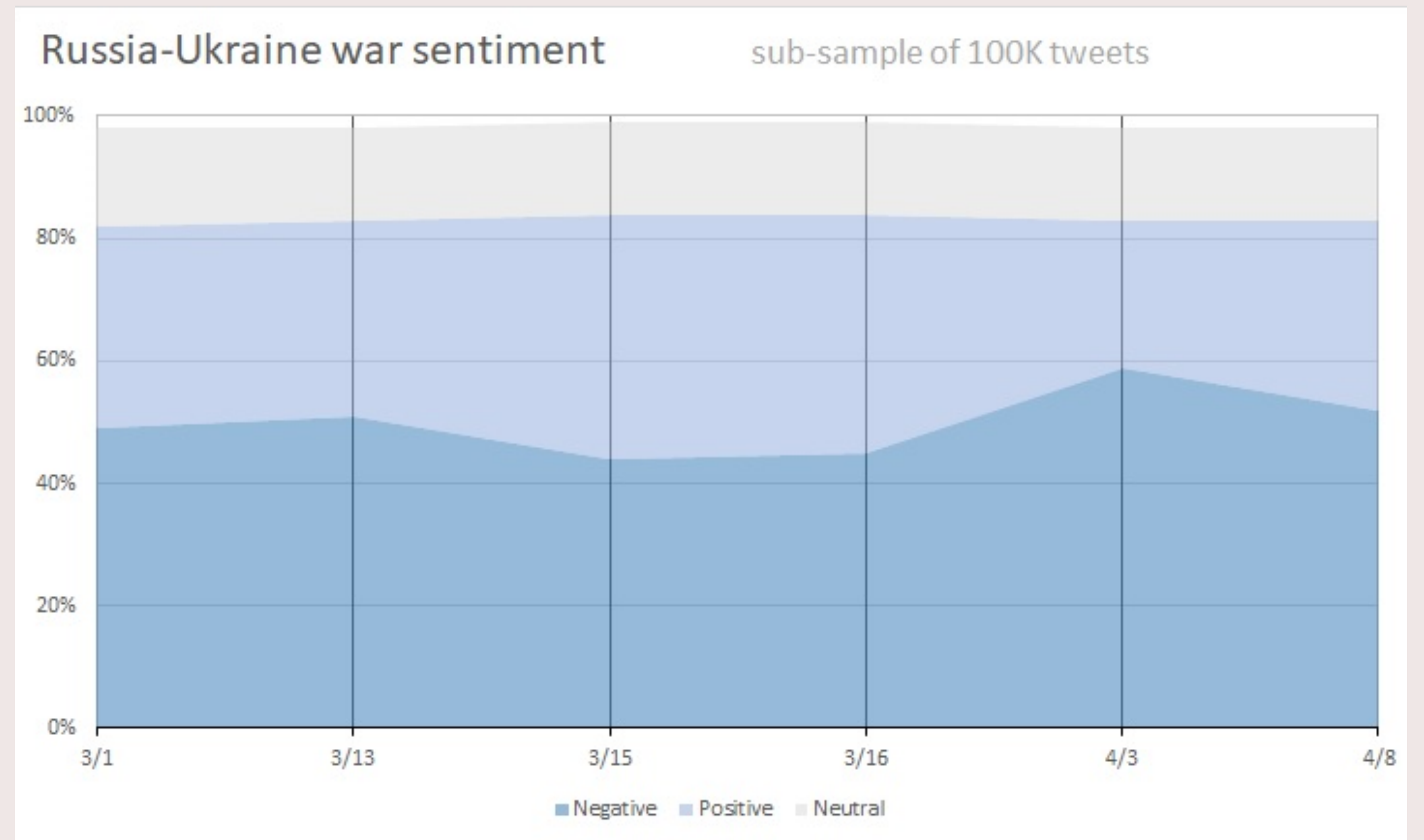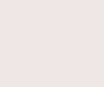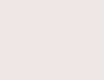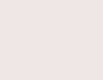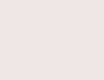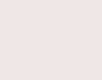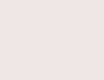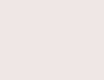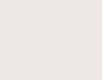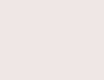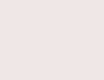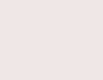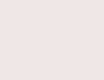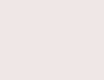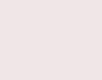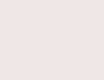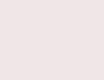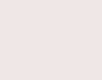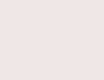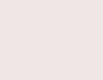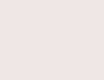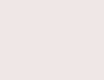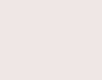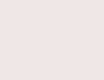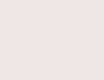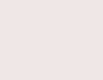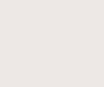
- March 01:

  - UN, NATO, security council, sky

- April 03:

  - genocide, crimes, women, killed

Top March 01 / **Characteristic**

Top March 01	Characteristic
exclude	bucha
sky	ukraine
close	kyiv
aggression	putin
council	ukrainian
ukrainerussiawar	russians
security	mariupol
kharkiv	ukrainians
un	civilians
country	kharkiv
invasion	ukrainerussiawar
president	nato
support	russia
nato	genocide
	aggression
Top April 03	russian
bucha	crimes
mass	exclude
hands	invasion
genocide	soldiers
mariupol	killed
bodies	bodies
women	troops
front	war
shot	sky
near	forces
crimes	un
region	stop
killed	army
	mass

Results

- March 01 - Representative tweets (based on VADER compound score)

  - Negative:

    - "Defeat Putin's Puppets"

    - "STOP the war now! #Ukraine"

  - Positive:

    - "This man is a hero and I just wanted to honor him #VolodymyrZelensky #Ukraine 💙💛💙💛💙💛"

    - "Help Ukraine"

Results

- April 03 - Representative tweets (based on VADER compound score)

  - Negative:

    - "#PutinWarCrimes: Bucha is not a battlefield but a CRIME SCENE! Rapes, executions, mass graves, corpses in the streets as Russia's REPUTATION is forever LOST! 👺💣🔥🪦👻😱"

  - Positive:

    - "The Right Man The Right Leader for dark times May The Universe Protect Him and His Loves Ones Today and forever #SlavaUkraini 🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻❤️🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙🌻💙BeFierce"

Conclusion

- Some attacks had little influence on the tone of the discourse (e.g., attack on military base), possibly because of neutral tone of reporting

- Reporting on the aftermath of Russia's retreat from Bucha might have been less neutral, resulting in increased intensity of tone in tweets

- A non-profit organization should act quickly to initiate a fundraising campaign to maximize engagement

Future work

- Examine news reporting and headlines

- Conduct research regarding likelihood of financial support based on a person's outlook of current events (i.e., would a negative or positive tweet be more indicative of someone willing to donate)

- Analyze how feelings might change as time passes (e.g., does a person still care two or three days later?)

- March 01 top terms:

```
['right', 'new', 'students', 'countries', 'news', 'says', 'peace', 'bomb', 'ukraineinvasion', 'eucopresident', 'israe
l', 'supplies', 'tv', 'russians', 'kiev', 'troops', 'vonderleyen', 'air', 'attack', 'soldiers', 'civilians', 'sanctio
ns', 'video', 'want', 'international', 'ukrainewar', 'children', 'anonymous', 'know', 'european', 'ukrainians', 'war
ukraine', 'zelensky', 'fighting', 'ukraineunderattack', 'poland', 'state', 'time', 'potus', 'indian', 'left', 'ukrain
e ukrainerussiawar', 'media', 'army', 'breaking', 'palestine', 'forces', 'need', 'said', 'city', 'europe', 'day', 'pr
esident', 'like', 'invasion', 'eu', 'russiaukrainewar', 'standwithukraine', 'support', 'russia ukraine', 'country',
'council stopputin', 'stopputin stoprussia', 'today', 'stop russian', 'ukraine nato', 'aggression ukraine', 'russian
aggression', 'help', 'military', 'ukraine russia', 'kharkiv', 'aggression', 'russiaukraine', 'nato close', 'stopputi
n', 'ukraine exclude', 'exclude russia', 'exclude', 'security council', 'russia security', 'sky ukraine', 'close sk
y', 'sky', 'world', 'council', 'close', 'security', 'stoprussia', 'stop', 'ukrainian', 'people', 'kyiv', 'nato', 'ukr
ainerussiawar', 'war', 'putin', 'russian', 'russia', 'ukraine']
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- April 03 top terms:

```
['ru', 'looted', 'kids', 'act', 'oblast', 'murdered', 'hello', 'girls', 'europe', 'kyiv region', 'russiaukrainewar',
'tied backs', 'trying', 'support', 'russian troops', 'backs', 'families', 'needs', 'says', 'let', 'leave', 'said', 'n
ear kyiv', 'genocideofukrainians', 'liberated', 'clear', 'road', 'russian soldiers', 'help', 'destroyed', 'stopputinn
ow', 'need', 'children', 'ukrainerussiawar', 'photo', 'time', 'occupiers', 'gas', 'right', 'crime', 'hands tied', 'st
op', 'genocide freeukraine', 'new', 'stopthewar ukraine', 'standwithukraine stopthewar', 'freeukraine standwithukrain
e', 'woman', 'genocide genocide', 'military', 'irpin', 'stopthewar', 'know', 'putinwarcrimes', 'freeukraine', 'atroci
ties', 'dead', 'left', 'army', 'region', 'shot', 'troops', 'tied', 'day', 'ukrainians', 'like', 'nato', 'city', 'rap
e', 'raped', 'mass', 'humiliate', 'hands', 'today', 'near', 'forces', 'war crimes', 'stoprussia', 'mariupol', 'soldie
rs', 'buchamassacre', 'crimes', 'russianwarcrimes', 'bodies', 'world', 'women', 'russians', 'people', 'killed', 'civi
lians', 'genocide', 'kyiv', 'ukrainian', 'putin', 'standwithukraine', 'war', 'bucha', 'russia', 'russian', 'ukraine']
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